What Every Operator Should Know About Future Limits

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Potential Future Limits

- Chloride Already Appearing in Some Permits
- Phosphorus MPCA Adopting New Standards
- Nitrogen -MPCA Requiring Nitrogen Monitoring



CHLORIDE

- Salty Parameter MPCA Requires Monitoring
 - Parameter POTWs will Have the Hardest Meeting
- Water Quality Standard 230 mg/l
 - Standard is Old and Outdated
- Is a Problem Wherever You Have Hard Water

Two Main Sources of Chloride in Lakes and Streams

Road Salt – Deicing



50-60%

Water Softeners



40-50%

History of Chlorides

- USGS High Chlorides in Metro Lakes
- Mining Raises Concerns About Sulfates
- MPCA POTWs Monitor for Salty Parameters
- MPCA puts WQBELs into NPDES Permits

Problem with Chlorides

- No Practical Way to Remove Chlorides
- Harder Water = Higher Chlorides

New Science Chloride Toxicity Decreases as

Hardness Increases

- WQS
 - Should be over 400 mg/l



Updated Method of Calculating Chloride Standard

WQS = 177.87 (Hardness)^{.205797}x(sulfate)^{-0.07452}

What Should You Be Doing

- Sample Upstream of POTW
- MPCA's Mass Balance Spreadsheet (need 7Q10)
- Tune Water Softeners to Decrease Chlorides
 - But it May Not Be Enough

Fine Tuning Water Softeners

- Most Commercial Softening is Already Tuned
- Softeners Come Pre-Set @ 30 grain/gal
- Newer Demand Softeners
- Duel Tank Softeners



Phosphorus & Proposed Nutrient Stream & River Standards

- Potentially the Biggest Change in Wastewater Treatment Since the Requirement for Secondary Treatment
- Will Cost
 - Cities Millions \$\$
 - Watersheds Billions \$\$
 - State Trillions \$\$

Phosphorus Will Now be Regulated Two Ways

Lakes Standards

- 1 mg/l Total Phosphorus
- Discharge < 30 miles –Lake</p>
- Expand Any DischargerImpacting a Lake

Stream & River Standard

Nutrient – Phosphorus

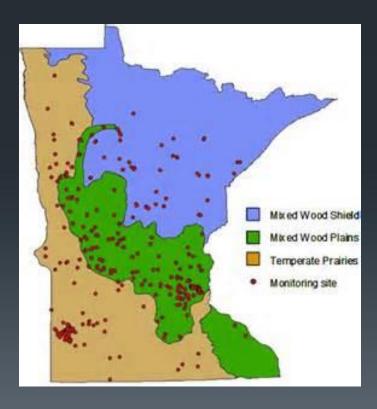
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- Response Variable
 - BOD
 - Chlorophyll a (summer)
 - D.O. Flux (day to night)

O

Periphyton

Ecoregion



Nutrient/Stressor

	Nutrient	Stressor					
Ecoregion	TP mg/l	Chlorophyll	DO Flux	BOD_5			
Blue	0.05	7	3	1.5			
Green	0.10	18	3.5	2.0			
yellow	0.15	35	4.5	3.0			

What does it mean?

If you Discharge to a Stream or River &

Stream or River Exceeds Standards

Phosphorus Limit

What Will The Limit Be?

- Limit Depends on Stream Flow/Conc.
- Probably in the 0.1-0.3 mg/l range
- Most Likely Require Tertiary Filtration
- MPCA doesn't know # Streams Impaired
 - The # Will be Significant

Cost of reducing P from 0.8 to 0.1 mg/l Weekly/Monthly/Annua

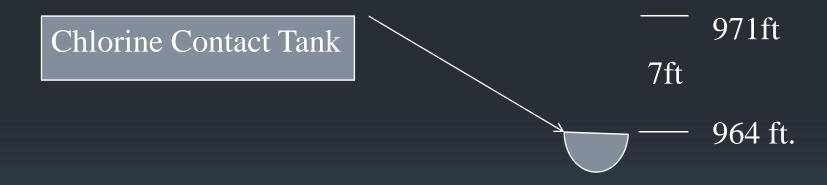
Flow (MGD)	Capital Low	Capital Averag e	Capital High	O&M Low	O&M Med	O&M High
0.2	0.76	1.66	2.60	0.008	0.06	0.11
1.5	1.12	3.53	6.48	0. <mark>1</mark> 0	0.21	0.32
5	2.46	7.78	16.48	0.14	0.52	0.90
10	3 <mark>.10</mark>	11.93	25.75	0.36	0.95	1.53
15	3.64	16.68	36.00	0.40	1.25	2.11
20	4.28	21.25	44.80	0.90	2.15	3.40
30	24.93	38.85	52.77	0.75	2.45	4.17

Meeting 0.1 mg/l Phosphorus Limit Would Require Effluent Filtration



What Happens If We Are Later Required to Remove Nitrogen?

Elevation Constraints Increase Costs Over MPCA Estimates



S. Fork Zumbro River

Rochester Filtration Estimates

Capital

Tertiary Filters

• \$51,973,000 _{MPCA}

Effluent Pumping

\$ 8,662,000 *

Total

\$ 60,635,000

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Tertiary Filters

- 3,400,000 _{MPCA}

Effluent Pumping

\$92,000 *

Total

\$3,492,000

Present Day Worth 20yr@5%

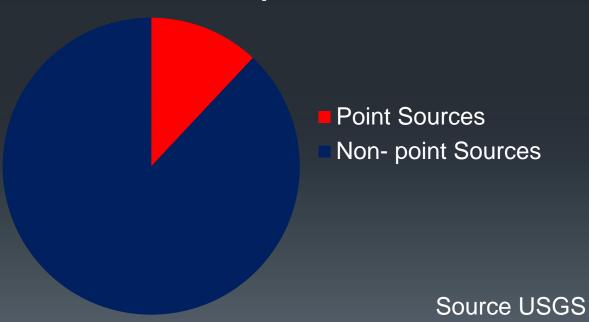
\$44,000,000

Total Capital O&M = \$105,000,000

*2004 Non-degradation Analysis Performed as part of NPDES Permit

Will it Make a Difference?





Timetable

- Nov 18, 2013
 - Rule Proposed
- Mar 28, 2014
 - Public Comment in front of ALJ
- May 2, 2014
 - ALJ report
- June 24, 2014
 - MPCA Board Approval
 - Governor approval
- October 29, 2014 +
 - MPCA has 180 Days to adopt
 - EPA approval

What can you do?

- Stay Informed
- Review Receiving Water Data
- Gather data TP, Summer Chlorophyll a, D.O. Flux
 - Upstream
 - Downstream
- Start Planning
 - Reserve Footprint for Tertiary Treatment
- Start Saving
- Think About Re-use

